

April 2, 2015

Ms. Sandra Perry
Triumvirate Environmental
200 Inner Belt Road
Somerville, Massachusetts 02143

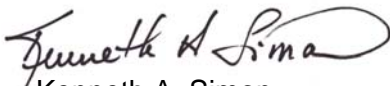
Dear Ms. Perry:

Enclosed, please find one (1) copy of our report presenting the results of a toxicity test completed using an effluent sample collected from the Exxon Mobil Terminal located in Everett, Massachusetts during March 2015. Acute toxicity was evaluated using the marine species, *Americamysis bahia*.

Please do not hesitate to call me, Kirk Cram or Petra Karbe should you have any questions regarding the report.

Sincerely,

EnviroSystems, Incorporated


Kenneth A. Simon
Technical Director

Enclosure

WET Test Report Certification
Report Number 25747-15-03
Email only

cc: Mr. Jason Pociask - Exxon Mobil (email only)
Mr. Darrell Interest - Triumvirate Environmental (email only)

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION

Permittee Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on: _____

Authorized Signature

Print or Type Name

ExxonMobil Oil Corporation

Print or Type the Permittee's Name

MA0000833

Type or Print the NPDES Permit No.

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION (Bioassay Laboratory)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on: April 2, 2015



Kenneth A. Simon
Technical Director - EnviroSystems, Inc.

April 2, 2015

Mr. Jason Pociask
Exxon Mobil Oil Corporation
52 Beacham Street
Everett, Massachusetts 02149

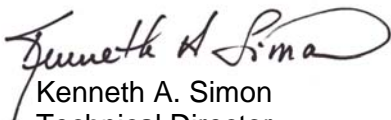
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Technical Director

Enclosure

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Report Number 25747-15-03
Email only

cc: Ms. Sandra Perry - Triumvirate Environmental (email only)
Mr. Darrell Interest - Triumvirate Environmental (email only)

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Authorized Signature

Print or Type Name

ExxonMobil Oil Corporation

Print or Type the Permittee's Name

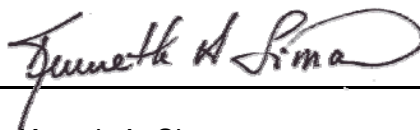
MA0000833

Type or Print the NPDES Permit No.

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION (Bioassay Laboratory)

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Executed on: April 2, 2015 _____



Kennth A. Simon
Technical Director - EnviroSystems, Inc.

**TOXICOLOGICAL EVALUATION
OF A TREATED INDUSTRIAL EFFLUENT
BIOMONITORING SUPPORT FOR A NPDES PERMIT:
March 2015**

Exxon Mobil Oil Corporation
Everett, Massachusetts
NPDES Permit Number MA0000833

Prepared For:

Exxon Mobil Oil Corporation
52 Beacham Street
Everett, Massachusetts 02149

Prepared By:

EnviroSystems, Incorporated
One Lafayette Road
Hampton, New Hampshire 03842

March 2015
Reference Number Exxon Mobil25747-15-03

STUDY NUMBER 25747

EXECUTIVE SUMMARY

The following summarizes the results of an acute exposure bioassay performed during March 2015 in support of the NPDES biomonitoring requirements of the Exxon Mobil terminal located in Everett, Massachusetts. An acute definitive assay was completed using the marine species, *Americamysis bahia*.

A. bahia were ≤ 5 days old at the start of the test. Dilution water, provided by ESI, was from the Hampton-Seabrook Estuary. This water is classified as SA-1 and has been used to culture marine test organisms since 1981. Samples were received under chain of custody in good order. All sample receipt, test conditions and control endpoints were within protocol specifications, except where otherwise noted.

The results presented in this report relate only to the samples described on the chain(s) of custody and sample receipt log(s), and are intended to be used only by the submitter. Results from the acute exposure assay and their relationship to permit limits are summarized in the following matrix.

Acute Toxicity Evaluation

Species	Exposure	LC-50	A-NOEC	Permit Limit (LC-50)	Effluent Meets Permit Limit	Assay Meets Protocol Limits
<i>Americamysis bahia</i>	48 Hours	>100%	50%	>50%	Yes	Yes

COMMENTS:

NC = Not Calculated.

**TOXICOLOGICAL EVALUATION
OF A TREATED INDUSTRIAL EFFLUENT
BIOMONITORING SUPPORT FOR A NPDES PERMIT:
March 2015**

Exxon Mobil Oil Corporation
Everett, Massachusetts
NPDES Permit Number MA0000833

1.0 INTRODUCTION

This report presents the results of an acute toxicity test completed on an effluent sample collected from the Exxon Mobil terminal located in Everett, Massachusetts. The sample was provided by Triumvirate Environmental, Somerville, Massachusetts. Testing was based on programs and protocols developed by the US EPA (2002), with exceptions as noted by US EPA Region I (2012), and involved completing a 48 hour acute toxicity test with the marine species, *Americamysis bahia*. Testing was performed at EnviroSystems, Incorporated (ESI), Hampton, New Hampshire in accordance with the provisions of TNI Standards (2009).

Acute toxicity tests involve preparing a series of concentrations by diluting effluent with control water. Groups of test animals are exposed to each effluent concentration and a control for a specified period. In acute tests, mortality data for each concentration are used to calculate (by regression) the median lethal concentration, or LC-50, defined as the effluent concentration that kills half of the test animals. Samples with high LC-50 values are less likely to cause significant environmental impacts. The acute no observed effect concentration (A-NOEC) provides information on the effluent concentration having minimal acute effects in the environment and is defined as the highest tested effluent concentration that causes no significant mortality.

2.0 MATERIALS AND METHODS

2.1 General Methods

Toxicological and analytical protocols used in this program follow procedures primarily designed to provide standard approaches for the evaluation of toxicological effects of discharges on aquatic organisms (US EPA 2002), and for the analysis of water samples (APHA 2012). See Section 4.0 for a list of references.

2.2 Test Species

When necessary, *A. bahia* were acclimated to approximate test conditions prior to use in the assay and then transferred to test chambers using a large bore glass pipet, minimizing the amount of water added to test solutions.

2.3 Effluent and Laboratory Water

Effluent collection information is provided in Table 1. Samples were stored at $4\pm 2^{\circ}\text{C}$ and warmed to $25\pm 1^{\circ}\text{C}$ prior to preparing test solutions. Effluent used in the *A. bahia* assay was salinity adjusted to 25 ± 2 ppt using artificial sea salts according to protocol (US EPA 2002). Laboratory water was collected from the Hampton/Seabrook Estuary. This water is classified as SA-1 and has been used to culture marine test organisms since 1981.

Total residual chlorine (TRC) was measured by amperometric titration (MDL 0.02 mg/L) in the effluent sample. Samples with ≥ 0.02 mg/L TRC were dechlorinated using sodium thiosulfate (US EPA 2002).

2.4 Acute Toxicity Tests

Test concentrations for the assay were 100% (undiluted), 50%, 25%, 12.5%, and 6.25% effluent. The 48 hour toxicity tests were conducted at $25\pm 1^{\circ}\text{C}$ with a photoperiod of 16:8 hours light:dark. Test chambers for the acute assays were 250 mL glass beakers containing 200 mL test solution in each of 4 replicates with 10 organisms/replicate. Replicates were not randomized during testing, rather organisms were added randomly at test initiation by replicate across test solutions in an alternating fashion (alternating allocation).

Survival and dissolved oxygen were measured daily in all replicates. Temperature, salinity, pH and specific conductivity were measured daily in one replicate of each test treatment.

2.5 Data Analysis

Data analysis involved, as required, determination of LC-50 values using CETIS™ v1.8.6.6, Comprehensive Environmental Toxicity Information System, software. The program computes LC-50 values using the Spearman-Kärber and Probit methods following protocol guidelines. If survival in the highest test concentration was >50%, LC-50 values were obtained by direct observation of the raw data. As needed, the A-NOEC was determined as the highest test concentration that caused no significant mortality.

2.6 Quality Control

As part of the laboratory quality control program, standard reference toxicant assays are completed on a regular basis for each test species. These results provide relative health and response data while allowing for comparison with historic data sets. See Table 2 for details.

3.0 RESULTS AND DISCUSSION

Results of the acute exposure bioassay completed using *A. bahia* are summarized in Table 3. Effluent and dilution water characteristics are presented in Table 4. Toxicity test summary sheets are included after the tables. Support data, including copies of laboratory bench sheets, are included in Appendix A.

Minimum test acceptability criteria require ≥90% survival in the control concentrations. Achievement of these results indicates that healthy test organisms were used and that the dilution water had no significant adverse impact on the outcome of the assay. See the Executive Summary and Table 3 for test acceptability.

4.0 LITERATURE CITED

- APHA. 2012. *Standard Methods for the Examination of Water and Wastewater*, 22nd Edition. Washington D.C.
- The NELAC Institute (TNI). 2009. *Environmental Laboratory Sector, Volume 1: Management and Technical Requirements for Laboratories Performing Environmental Analysis (TNI Standard)*. EL-V1-2009.
- US EPA. 2002. *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms*. Fifth Edition. EPA-821-R-02-012.
- US EPA Region I. 2012. *Marine Acute Toxicity Test Procedure and Protocol*. US EPA Region I Office, Boston, Massachusetts. July 2012.

**TABLE 1. Summary of Sample Collection Information.
Exxon Mobil Terminal Effluent Evaluation. March 2015.**

Sample Description	Type	Collection		Receipt		Arrival Temp °C
		Date	Time	Date	Time	
Outfall 01C	Grab	03/18/15	1315	03/19/15	1100	1 ^a

COMMENTS:

^a Upon receipt, the temperature was outside of the range of 4±2°C recommended by the protocol for chemistry samples (0-6°C acceptable for effluent samples).

**TABLE 2. Summary of Reference Toxicant Data.
Exxon Mobil Terminal Effluent Evaluation. March 2015.**

Date		Endpoint	Value	Historic Mean/ Central Tendency	Acceptable Range	Reference Toxicant
<i>A. bahia</i>						
03/26/15	Survival	48Hr LC-50	16.6	20.6	13.8 - 27.3	SDS (mg/L)

Means and Acceptable Ranges based on the most recent 20 reference toxicant assays

**TABLE 3. Summary of Acute Evaluation Results.
Exxon Mobil Terminal Effluent Evaluation. March 2015.**

Species	Exposure	Lab	Survival				
			6.25%	12.5%	25%	50%	100%
<i>A. bahia</i>	48 hours	95%	90%	92.5%	85%	92.5%	80%

Species	Exposure	LC-50 Computation Technique				A-NOEC
		Spearman-Kärber	Probit	Direct Observation		
<i>A. bahia</i>	48 Hours	NC	NC	>100%		50%

COMMENTS:

NC = Not Calculated.

**TABLE 4. Summary of Effluent and Diluent Characteristics.
Exxon Mobil Terminal Effluent Evaluation. March 2015.**

PARAMETER	UNITS	EFFLUENT	LABORATORY WATER
pH - As Received	SU	7.19	7.92
Salinity - As Received	ppt	<1	24
TRC	mg/L	<0.02	<0.02
Total Solids	mg/L	690	27000
Total Suspended Solids	mg/L	<1	1.5
Ammonia	mg/L as N	<0.1	<0.1
Total Organic Carbon	mg/L as C	3.7	0.6
Aluminum, total	mg/L	<0.02	-
Cadmium, total	mg/L	<0.0005	-
Chromium, total	mg/L	<0.002	-
Copper, total	mg/L	<0.002	-
Lead, total	mg/L	<0.0005	-
Mercury	µg/L	<0.01	-
Nickel, total	mg/L	<0.002	-
Zinc, total	mg/L	0.026	-

Additional water quality and analytical chemistry support data are available in Appendix A.

TOXICITY TEST SUMMARY SHEET

FACILITY NAME: Exxon Mobil Everett Terminal TEST START DATE: 03/19/15
 NPDES PERMIT NO.: MA0000833 TEST END DATE: 03/21/15

TEST TYPE	TEST SPECIES	SAMPLE TYPE	SAMPLE METHOD
<input checked="" type="checkbox"/> Acute	<input type="checkbox"/> <i>Pimephales promelas</i>	<input type="checkbox"/> Prechlorinated	<input checked="" type="checkbox"/> Grab
<input type="checkbox"/> Chronic	<input type="checkbox"/> <i>Ceriodaphnia dubia</i>	<input type="checkbox"/> Dechlorinated	<input type="checkbox"/> Composite
<input type="checkbox"/> Modified Chronic (Reporting Acute Values)	<input type="checkbox"/> <i>Daphnia pulex</i>	<input type="checkbox"/> Chlorine Spiked in Lab	<input type="checkbox"/> Flow-thru
<input type="checkbox"/> 24 Hour Screen	<input checked="" type="checkbox"/> <i>Americamysis bahia</i>	<input type="checkbox"/> Chlorinated on Site	<input type="checkbox"/> Other
	<input type="checkbox"/> <i>Cyprinodon variegatus</i>	<input type="checkbox"/> Unchlorinated	
	<input type="checkbox"/> <i>Menidia beryllina</i>	<input checked="" type="checkbox"/> No Detectable Chlorine Upon Receipt	
	<input type="checkbox"/> <i>Arbacia punctulata</i>		

DILUTION WATER:

☐ Receiving water collected at a point upstream or away from the discharge, free from toxicity or other sources of contamination; Receiving Water Name: Island End River (Mystic River Watershed)

☒ Alternate surface water of known quality and hardness, to generally reflect the characteristics of the receiving water; Receiving Water Name: Hampton Estuary

☐ Synthetic water prepared using either Millipore Milli-Q or equivalent deionized water and reagent grade chemicals; or deionized water combined with mineral water.

☐ Artificial sea salts mixed with deionized water

☐ Deionized water and hypersaline brine

☐ Other

EFFLUENT SAMPLING DATES: 03/18/15 _____

EFFLUENT CONCENTRATIONS TESTED (%): 6.25%, 12.5%, 25%, 50%, 100%

Permit Limit Concentration: >50 %

Was the effluent salinity adjusted? Yes If "yes", to what level? 26 ppt

REFERENCE TOXICANT TEST DATE: 03/26/15 LC-50: 16.6 mg/L Sodium Dodecyl Sulfate

PERMIT LIMITS AND TEST RESULTS

Test Acceptability Criteria

Mean Control Survival: 95 %

LIMITS

LC-50: >50 %

A-NOEC: _____ %

C-NOEC: _____ %

IC- _____ %

RESULTS

LC-50 >100 %

Upper Limit: _____ -

Lower Limit: _____ -

Method: Direct observation

A-NOEC 50 %

C-NOEC _____ - %

IC- _____ - %

APPENDIX A
DATA SHEETS
STATISTICAL SUPPORT

Contents	Number of Pages
Methods Used in NPDES Permit Biomonitoring Testing	1
<i>A. bahia</i> Acute Bioassay Bench Sheet	2
<i>A. bahia</i> Survival Statistics	3
<i>A. bahia</i> Organism Culture Sheet	1
Preparation of Dilutions and Record of Meters Used	1
Analytical Chemistry Data Report	2
Sample Receipt Record	1
Chain of Custody	1
Assay Review Checklist	1
Total Appendix Pages	13

METHODS USED IN NPDES PERMIT BIOMONITORING TESTING

Parameter	Method
Acute Exposure Bioassays:	
<i>Ceriodaphnia dubia</i>	EPA-821-R-02-012 2002.0
<i>Daphnia pulex</i>	EPA-821-R-02-012 2021.0
<i>Pimephales promelas</i>	EPA-821-R-02-012 2000.0
<i>Americamysis bahia</i>	EPA-821-R-02-012 2007.0
<i>Menidia beryllina</i>	EPA-821-R-02-012 2006.0
<i>Cyprinodon variegatus</i>	EPA-821-R-02-012 2004.0
Chronic Exposure Bioassays:	
<i>Ceriodaphnia dubia</i>	EPA-821-R-02-013 1002.0
<i>Pimephales promelas</i>	EPA-821-R-02-013 1000.0
<i>Cyprinodon variegatus</i>	EPA-821-R-02-014 1004.0
<i>Menidia beryllina</i>	EPA-821-R-02-014 1006.0
<i>Arbacia punctulata</i>	EPA-821-R-02-014 1008.0
<i>Champia parvula</i>	EPA-821-R-02-014 1009.0
Trace Metals:	
Trace Metals	EPA 200.8/SW 6020, EPA 245.7
Hardness	Standard Methods 22 nd Edition - Method 2340 B
Wet Chemistries:	
Alkalinity	EPA 310.2
Chlorine, Residual	Standard Methods 22 nd Edition - Method 4500-Cl D
Total Organic Carbon	Standard Methods 22 nd Edition - Method 5310 C
Specific Conductance	Standard Methods 22 nd Edition - Method 2510 B
Nitrogen - Ammonia	Standard Methods 22 nd Edition - Method 4500-NH ₃ G
pH	Standard Methods 22 nd Edition - Method 4500-H+ B
Solids, Total (TS)	Standard Methods 22 nd Edition - Method 2540 B
Solids, Total Dissolved (TDS)	Standard Methods 22 nd Edition - Method 2540 C
Solids, Total Suspended (TSS)	Standard Methods 22 nd Edition - Method 2540 D
Dissolved Oxygen	Standard Methods 22 nd Edition - Method 4500-O G

Please visit our web site at www.envirosystems.com for a copy of our accreditations and state certifications.

ACUTE BIOASSAY DATA SUMMARY

STUDY: 25747		Brine Shrimp: A- 3714		"AS RECEIVED" EFFLUENT AND DILUENT CHEMISTRIES															
CLIENT: Exxon Mobil		TEST ORGANISM: A. bahia		T. Metals	TOC	AMM	TS/SS	pH	S/C	SALINITY	TRC								
SAMPLE: Terminal Effluent		ORGANISM SUPPLIER / BATCH / AGE:		EFF	TOC	AMM	TS/SS	pH	S/C	SALINITY	TRC								
DILUENT: Lab Salt		See Organism Culture Sheet		25701 DIL	004	004	005	7.19	1209	0.6	0.02								
SALINITY ADJUSTMENT RECORD: 4000 ML EFFLUENT + 112 G SEA SALTS (A-3700) = 100% ACTUAL PERCENTAGE																			
CONC	REP	SURVIVAL			DO (mg/L)	pH (SU)			TEMP (°C)			S/C (µmhos/cm)			SALINITY (ppt)				
		0	24	48	0	24	48	0	24	48	0	24	48	0	24	48			
LAB	A	10	10	9	6.6	7.1	6.7	7.92	7.92	7.92	23	23	22	37310	39370	40520	24	25	26
	B	10	10	10	6.6	7.1	6.7												
	C	10	10	10	6.6	6.7	6.7												
	D	10	9	9	6.6	6.7	6.8												
6.25%	A	10	10	9	6.7	6.7	6.8	7.92	7.94	7.94	23	23	22	37840	40200	41800	24	26	27
	B	10	10	9	6.7	6.7	6.8												
	C	10	9	9	6.7	6.7	6.7												
	D	10	10	9	6.7	6.8	6.7												
12.5%	A	10	10	10	6.8	6.7	6.8	7.92	7.95	7.96	23	23	22	38010	40000	42200	24	26	27
	B	10	10	8	6.8	6.7	6.8												
	C	10	10	9	6.8	6.7	6.8												
	D	10	10	10	6.8	6.8	6.7												
25%	A	10	10	8	6.9	6.7	6.8	7.90	7.98	8.00	24	23	22	38550	39770	42300	24	25	27
	B	10	10	9	6.9	6.6	6.7												
	C	10	10	8	6.9	6.7	6.7												
	D	10	10	9	6.9	6.7	6.7												
DATE	3/19/15		3/20/15		3/21/15														
TIME	1455		1430		1325														
INITIALS	SA		BG		PS														

ACUTE BIOASSAY DATA SUMMARY

STUDY: 25747																			
CLIENT: Exxon Mobil		TEST ORGANISM: A. bahia																	
SAMPLE: Terminal Effluent		ORGANISM SUPPLIER / BATCH / AGE:																	
DILUENT: Lab Salt		See Organism Culture Sheet																	
		DO				pH		TEMP		S/C		Salinity							
50%	A	10	10	9	7.2	6.7	6.8	7.87	8.63	8.05	24	24	22	89120	40590	44030	25	26	28
	B	10	10	10	7.2	6.6	6.6												
	C	10	10	9	7.2	6.6	6.7												
	D	10	10	9	7.2	6.6	6.7												
100%	A	10	10	7	8.6	6.6	6.5	7.82	8.11	8.13	24	24	22	410540	42360	46730	26	27	30
	B	10	10	8	8.6	6.6	6.5												
	C	10	10	8	8.6	6.6	6.6												
	D	10	10	9	8.6	6.6	6.6												
DATE	3/19/15		3/20/15		3/21		03/19/15		3/20/15		3/21								
TIME	1455		1430		1325		1355		1350		1220								
INITIALS	SA		BSG		RS		EH		GL		BL								

CETIS Summary Report

Report Date: 24 Mar-15 11:04 (p 1 of 1)
 Test Code: 25747Ab | 18-1720-3350

Americamysis 48-Hr Survival Test							EnviroSystems, Inc.				
Batch ID:	09-0404-6523	Test Type:	Survival (48h)				Analyst:				
Start Date:	19 Mar-15 14:55	Protocol:	EPA/821/R-02-012 (2002)				Diluent:	Laboratory Seawater			
Ending Date:	21 Mar-15 13:25	Species:	Americamysis bahia				Brine:	Generic commercial salts			
Duration:	46h	Source:	ARO - Aquatic Research Organisms, NH				Age:	<5 d			
Sample ID:	03-8665-8559	Code:	25747				Client:	Exxon Mobil Oil Corporation			
Sample Date:	18 Mar-15 13:15	Material:	Industrial Effluent				Project:	WET Biannual Compliance Test (1st)			
Receive Date:	19 Mar-15 11:00	Source:	Exxon Mobil Everett Terminal								
Sample Age:	26h (1 °C)	Station:	MA0000833; Outfall 01C								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
02-5096-2637	48h Proportion Survived	50	100	70.71	10.9%	2	Dunnett Multiple Comparison Test				
48h Proportion Survived Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Seawater	4	0.95	0.858	1	0.9	1	0.0289	0.0577	6.08%	0.0%
6.25		4	0.9	0.9	0.9	0.9	0.9	0	0	0.0%	5.26%
12.5		4	0.925	0.773	1	0.8	1	0.0479	0.0957	10.4%	2.63%
25		4	0.85	0.758	0.942	0.8	0.9	0.0289	0.0577	6.79%	10.5%
50		4	0.925	0.845	1	0.9	1	0.025	0.05	5.41%	2.63%
100		4	0.8	0.67	0.93	0.7	0.9	0.0408	0.0816	10.2%	15.8%
48h Proportion Survived Detail											
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4						
0	Lab Seawater	0.9	1	1	0.9						
6.25		0.9	0.9	0.9	0.9						
12.5		1	0.8	0.9	1						
25		0.8	0.9	0.8	0.9						
50		0.9	1	0.9	0.9						
100		0.7	0.8	0.8	0.9						

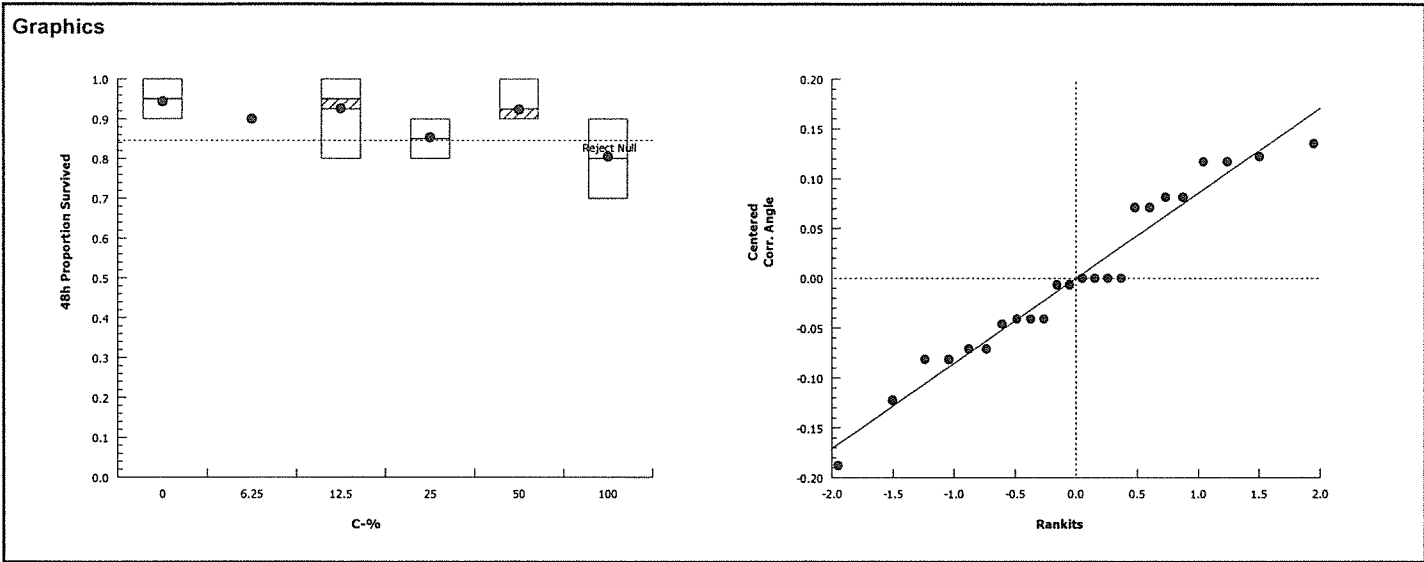
CETIS Analytical Report

Report Date: 24 Mar-15 11:04 (p 1 of 2)

Test Code: 25747Ab | 18-1720-3350

Americamysis 48-Hr Survival Test										EnviroSystems, Inc.	
Analysis ID: 02-5096-2637		Endpoint: 48h Proportion Survived				CETIS Version: CETISv1.8.6					
Analyzed: 24 Mar-15 11:03		Analysis: Parametric-Control vs Treatments				Official Results: Yes					
Sample ID: 03-8665-8559		Code: 25747				Client: Exxon Mobil Oil Corporation					
Sample Date: 18 Mar-15 13:15		Material: Industrial Effluent				Project: WET Biannual Compliance Test (1st)					
Receive Date: 19 Mar-15 11:00		Source: Exxon Mobil Everett Terminal									
Sample Age: 26h (1 °C)		Station: MA0000833; Outfall 01C									
Data Transform		Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU	
Angular (Corrected)		NA	C > T	NA	NA	10.9%	50	100	70.71	2	
Dunnett Multiple Comparison Test											
Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)		
Lab Seawater		6.25	1.2	2.41	0.163	6	0.3354	CDF	Non-Significant Effect		
		12.5	0.524	2.41	0.163	6	0.6369	CDF	Non-Significant Effect		
		25	2.25	2.41	0.163	6	0.0666	CDF	Non-Significant Effect		
		50	0.602	2.41	0.163	6	0.6024	CDF	Non-Significant Effect		
		100*	3.21	2.41	0.163	6	0.0100	CDF	Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.1341878		0.02683757		5	2.93	0.0416	Significant Effect			
Error	0.1648202		0.009156679		18						
Total	0.2990081				23						
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Mod Levene Equality of Variance			2.16	4.25	0.1051	Equal Variances				
Variances	Levene Equality of Variance			3.46	4.25	0.0229	Equal Variances				
Distribution	Shapiro-Wilk W Normality			0.953	0.884	0.3107	Normal Distribution				
48h Proportion Survived Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Seawater	4	0.95	0.858	1	0.95	0.9	1	0.0289	6.08%	0.0%
6.25		4	0.9	0.9	0.9	0.9	0.9	0.9	0	0.0%	5.26%
12.5		4	0.925	0.773	1	0.95	0.8	1	0.0479	10.4%	2.63%
25		4	0.85	0.758	0.942	0.85	0.8	0.9	0.0289	6.79%	10.5%
50		4	0.925	0.845	1	0.9	0.9	1	0.025	5.41%	2.63%
100		4	0.8	0.67	0.93	0.8	0.7	0.9	0.0408	10.2%	15.8%
Angular (Corrected) Transformed Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Seawater	4	1.33	1.18	1.48	1.33	1.25	1.41	0.047	7.07%	0.0%
6.25		4	1.25	1.25	1.25	1.25	1.25	1.25	0	0.0%	6.12%
12.5		4	1.3	1.06	1.53	1.33	1.11	1.41	0.0735	11.3%	2.67%
25		4	1.18	1.05	1.31	1.18	1.11	1.25	0.041	6.95%	11.5%
50		4	1.29	1.16	1.42	1.25	1.25	1.41	0.0407	6.32%	3.06%
100		4	1.11	0.946	1.28	1.11	0.991	1.25	0.0528	9.48%	16.3%

Americamysis 48-Hr Survival Test			EnviroSystems, Inc.
Analysis ID: 02-5096-2637	Endpoint: 48h Proportion Survived	CETIS Version: CETISv1.8.6	
Analyzed: 24 Mar-15 11:03	Analysis: Parametric-Control vs Treatments	Official Results: Yes	





Aquatic Research Organisms

DATA SHEET

02ABAR0031815

I. Organism History

Species AMERICAMYSIS BAHIA

Source: Lab reared ☒ Hatchery reared ☐ Field collected ☐

Hatch date 3-15-15 Receipt date

Lot number 031515MS Strain

Brood origination FLORIDA

II. Water Quality

Temperature 25 °C Salinity ~28 ppt D.O. ppm

pH 7.8 su Hardness ppm Alkalinity ppm

III. Culture Conditions

Freshwater ☐ Saltwater ☒ Other ☐

Recirculating ☒ Flow through ☐ Static renewal ☐

DIET: Flake food ☒ Phytoplankton ☐ Trout chow ☐

Artemia ☒ Rotifers ☐ YCT ☐ Other ENCAP. SHRIMP DIET

Prophylactic treatments:

Comments:

IV. Shipping Information

Client: ESL # of Organisms 520+

Carrier: Date shipped 3-18-15

Biologist: Mark [Signature]

RECORD OF METERS USED

STUDY: 25747		CLIENT: Exxon Mobil	
Exposure (Hours)			
	0	24	48
Water Quality Station #	1		1
Initials / Date	EH 03/19/15	BL 3/10	BL 3/12

Water Quality Station #1	Water Quality Station #2	COMMENTS
DO meter # 24	DO meter #	
DO probe # 94	DO probe #	
pH meter # 1097	pH meter #	
pH probe # 131	pH probe #	
S/C meter # Y51303	S/C meter #	
S/C probe #	S/C probe #	
Salinity meter #	Salinity meter #	

PREPARATION OF DILUTIONS

Diluent: Lab Salt	Day: 0 Sample:	Final Vol. (mls)
Concentration %	Vol. Eff. (mls)	
Lab	0	800
RW	0	
6.25%	50	
12.5%	100	
25%	200	
50%	400	
100%	800	
INITIALS:	EH	
TIME:	04:13:35	
DATE:	03/19/15	

Report No: 25747
Project: Exxon Mobil

SDG:

Sample ID: Outfall 01C
Matrix: Water
Sampled: 03/19/15 1315

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Total solids	25747-006	690	10	mg/L	03/23/15 1100	03/27/15 1215	AC /SM2540B
Total suspended solids	25747-006	ND	1	mg/L	03/24/15 1430	03/27/15 1330	BG /SM 2540D
Total organic carbon	25747-004	3.7	0.4	mg/L	03/27/15	03/27/15	MG /SM 5310 C
Ammonia-N	25747-005	ND	0.1	mg/L as N	03/27/15 0946	03/27/15 0946	MG /SM 4500-NH3 G
Aluminum, total	25747-002	ND	0.02	mg/L	03/24/15	03/24/15	JLH/EPA 200.8
Cadmium, total	25747-002	ND	0.0005	mg/L	03/24/15	03/24/15	JLH/EPA 200.8
Calcium, total	25747-002	58	0.05	mg/L	03/24/15	03/24/15	JLH/EPA 200.8
Chromium, total	25747-002	ND	0.002	mg/L	03/24/15	03/24/15	JLH/EPA 200.8
Copper, total	25747-002	ND	0.002	mg/L	03/24/15	03/24/15	JLH/EPA 200.8
Lead, total	25747-002	ND	0.0005	mg/L	03/24/15	03/24/15	JLH/EPA 200.8
Magnesium, total	25747-002	6	0.05	mg/L	03/24/15	03/24/15	JLH/EPA 200.8
Mercury, total	25747-003	ND	0.01	ug/L	03/25/15	03/25/15	JLH/EPA 245.7
Nickel, total	25747-002	ND	0.002	mg/L	03/24/15	03/24/15	JLH/EPA 200.8
Zinc, total	25747-002	0.026	0.002	mg/L	03/24/15	03/24/15	JLH/EPA 200.8

Notes:

ND = Not Detected

ESI

Report No: 25701
Project: Diluent - Laboratory Seawater

SDG:

Sample ID: 25ppt Lab Salt 03/19/15
Matrix: Water
Sampled: 03/19/15 1350

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Total solids	25701-021	27000	100	mg/L	03/23/15 1100	03/27/15 1215	AC /SM2540B
Total suspended solids	25701-021	1.5	1	mg/L	03/24/15 1430	03/27/15 1330	BG /SM 2540D
Total organic carbon	25701-019	0.6	0.4	mg/L	03/27/15	03/27/15	MG /SM 5310 C
Ammonia-N	25701-020	ND	0.1	mg/L as N	03/27/15 1018	03/27/15 1018	MG /SM 4500-NH3 G

Notes:

ND = Not Detected

ESI

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

Page 1 of 1

STUDY NO: 25747
 SDG No:
 Project: Exxon Mobil
 Delivered via: ESI
 Date and Time Received: 03/19/15 1100 Date and Time Logged into Lab: 03/19/15 1240
 Received By: DW Logged into Lab by: EH *EH*
 Air bill / Way bill: No Air bill included in folder if received? NA
 Cooler on ice/packs: Yes Custody Seals present? NA
 Cooler Blank Temp (C) at arrival: 1 Custody Seals intact? NA
 Number of COC Pages: 1
 COC Serial Number(s): A1011578
 COC Complete: Yes Does the info on the COC match the samples? Yes
 Sampled Date: Yes Were samples received within holding time? Yes
 Field ID complete: Yes Were all samples properly labeled? Yes
 Sampled Time: Yes Were proper sample containers used? Yes
 Analysis request: Yes Were samples received intact? (none broken or leaking) Yes
 COC Signed and dated: Yes Were sample volumes sufficient for requested analysis? Yes
 Were all samples received? Yes Were VOC vials free of headspace? NA
 Client notification/authorization: Not required

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
Outfall 01C	25747-001	W	AB48AD StartSample	2x3750 P	4 C	
Outfall 01C	25747-002	W	Total Metals Cd,Cr,Ni,Pb,Cu,Zn,Al,Ca,Mg;	250 P	HNO3	Yes
Outfall 01C	25747-003	W	Total Metals Hg;	125 G	HCl	Yes
Outfall 01C	25747-004	W	TOC	1x40 G	H2SO4	Yes
Outfall 01C	25747-005	W	NH3;	125 P	H2SO4	Yes
Outfall 01C	25747-006	W	TS,TSS	1000 P	4 C	
Outfall 01C	25747-007	W	TSS HOLD	1000 P	4 C	
Outfall 01C	25747-008	W	TSS HOLD	1000 P	4 C	

Notes and qualifications:

See COC

CHAIN OF CUSTODY DOCUMENTATION

Client: Exxon Mobil		Contact: Jason Pociask & Darrell Interest		Project Name: Exxon Mobil - Everett Terminal								
Report to: Jason Pociask & Darrell Interest		Address: 52 Beacham St.		Project Number: P0335 Task: 0001								
Invoice to: Accounts Payable		Address: Everett, MA 02149		Project Manager: Jason Pociask & Darrell Interest								
Voice: 617-715-8947		Fax: NA		email: jason.e.pociask@exxonmobil.co								
Protocol: NPDES												
Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
001 Outfall 01C		3.18.15	1315	VSING	A	2	3750	P	4 C	Water	N	AB48AD StartSample
002 Outfall 01C						1	250	P	HNO3	Water	N	Total Metals Cd,Cr,Ni,Pb,Cu,Zn,Al,Ca,Mg;
003 Outfall 01C						1	125	G	HCl	Water	N	Total Metals Hg;
004 Outfall 01C						1	40	G	H2SO4	Water	N	TOC
005 Outfall 01C						1	125	P	H2SO4	Water	N	NH3;
006 Outfall 01C						1	1000	P	4 C	Water	N	TS,TSS
007 Outfall 01C						1	1000	P	4 C	Water	N	TSS HOLD
008 Outfall 01C						1	1000	P	4 C	Water	N	TSS HOLD
Relinquished By: [Signature]		Date: 3.18.15		Time: 1500		Received By: [Signature]		Date: 3-19-15		Time: 11:00		
Relinquished By: [Signature]		Date: 3.18.15		Time: 1000		Received at Lab By:		Date:		Time:		
Comments: Was locked up yesterday												

ERR

COC Number: A1011578

Sample Delivery Group No: Feb 2015

Page 1 of 1

Assay Review Checklist

DATE IN: 3/18/15
 DATE DUE: 4/15/15

STUDY#: 25747
 CLIENT: Exxon Mobil
 PROJECT: Exxon Mobil
 ASSAY: AB4840

Project Paperwork Check for Completeness			
	Date	Initials	Comments
Day 0	3/19/15	SA	
Day 1	3/20/15	BG	
Day 2	3/21/15	RS	
Day 3			
Day 4			
Day 5			
Day 6			
Day 7			
Day 8			

Analyst Data Review	Date	Initials	Comments
Chains of Custody Complete	3/23/15	LB	
Sample Receipt Complete			
Organism Culture Sheet(s)			
Bench Sheets Complete (dates, times, initials, etc...)			
Water Quality Data Complete			
TRC Values & Bottle Numbers			
Daphnid Calculations Complete	N/A		
Weights Reported			
Assay Acceptability Review	3/23/15		

Technical Report Review	Date	Initials	Comments
Statistical Analysis Complete	3/24/15	MR	
Statistical Analysis Reviewed	3/24/15	LB	
Data Acceptability Review	3/24/15	MR	
Supporting Chemistry Report	4/2/15	MR	
Draft Report	3/24/15	LB	
QA Audit/Review Complete			
Final Report Reviewed	4/2/15	MR	
Final Report Printed - PDF			
Executive Summary / Chems Sent	3/30/15	KC(MR)	
Report E-mailed / Faxed	4/2/15	MR	
Report Logged Out / Invoice Sent			
Report Scanned to Archive			